Wind River Basin/Madden Field Case Study

Allen Middleman (amiddleman@br-ine.com; 915 688 9048)
Burlington Resources Oil and Gas Company
3300 N. "A" St., Bldg. 6
Midland, Texas 79705-5406

Blackhawk Geometrics, Inc.
301 B. Commercial Road
Golden, CO 80401

Abstract

Naturally occurring effective fractures strongly influence the flow rates of gas wells in the Madden field, Fremont and Natrona Counties, Wyoming. The objective of this project was to characterize the spatial distribution of natural fractures from which gas is produced in the Tertiary, Lower Fort Union (LFU) interval in Madden Field. A cost-effective means of predicting the presence of these fractures can help manage risk associated with field development. It was hoped that P wave seismic data could be used to diagnose the fracture density and orientation within the 37 square mile 3D area. The seismic processing was designed to reveal the azimuthal anisotropy in the seismic response of the target interval.

A Gas Prospectivity Map, which incorporates both geologic and geophysical attributes, was created from the available data. A positive correlation was found to exist between this map and LFU well reserve estimates. The seismic techniques used in this study provide a cost-effective tool to evaluate fracture intensity and direction in the LFU. The results of this study are taken into account, along with other subsurface and production data, in the ongoing Madden field LFU development program.